THE ASTROPHYSICAL JOURNAL

Founded in 1895 by George E. Hale and James E. Keeler

ROBERT C. KENNICUTT, JR.
Editor-in-Chief
Steward Observatory
University of Arizona

A. DALGARNO
Letters Editor
Harvard-Smithsonian
Center for Astrophysics

JAMES W. LIEBERT
Associate Editor-in-Chief
Steward Observatory
University of Arizona

EUGENE H. AVRETT
Deputy Letters Editor
Harvard-Smithsonian
Center for Astrophysics

JULES P. HALPERN
Associate Letters Editor
Columbia University

ANNEILA I. SARGENT
Associate Letters Editor
California Institute of Technology

JOSEPH I. SILK
Associate Letters Editor
University of California, Berkeley

AAS PUBLICATIONS BOARD

BRUCE G. ELMEGREEN (1999–2002), *Chairperson*
IBM TJ Watson Research Center

ALYSSA A. GOODMAN (1998–2001)
Harvard University

JOEL E. TOHLINE (1999–2001)
Louisiana State University

RONALD E. TAAM (1999–2002)
Northwestern University

JEAN TURNER (2000–2003)
University of California, Los Angeles

RAYMOND CARLBERG (2000–2003)
University of Toronto

MICHAEL F. A'HEARN (2001–2004)
University of Maryland

Publication Director: JULIE STEFFEN
Publication Manager: KERRY KROFFE
Production Manager: CAROLYN CHMIEL
Chief Manuscript Editor: SHARON JENNINGS
Manuscript Editors: WALTER G. GLASCOFF III, BETH GARRISON, THAD A. DORIA, PAUL RUICH, ELIZABETH HUYCK, ERIC SHUTT, KATHRYN KRAYNIK, RACHEL L. DRZEWICKI, ROCHELLE COHEN LODDER, JEREMY HORSEFIELD, KERRY TUPPER, KEVIN S. BECK, ALISON COMPTON, ED MARTIN, KRISTIE REILLY, SARI COHEN, BRIAN ROBINSON, AND LAURIE THRASHER
Production Staff: CINDY GARRETT, CECILIA HILGEMAN, ANJELICA SLOAN, LYVETTE MARSH, ASHLEY TOWNE, GREG GILLAM, URMI BHOWMIK, JAMES CAVICCHIA, ELIZABETH COOK, AND ALICE LEE
Cambridge Editorial Office: ANGELA BROWN, MARY GUILLEMETTE, LAURIE ELLIS, KRISTA WOODBRIDGE, MELAINA A. E. GOVERNATORE, AND JOAN M. FLANAGAN

VOLUME 559, PART 2
2001 SEPTEMBER 20 AND OCTOBER 1

PUBLISHED BY THE UNIVERSITY OF CHICAGO PRESS FOR
THE AMERICAN ASTRONOMICAL SOCIETY

© 2001 BY THE AMERICAN ASTRONOMICAL SOCIETY. ALL RIGHTS RESERVED.
PUBLISHED THREE TIMES A MONTH

COMPOSED BY THE UNIVERSITY OF CHICAGO PRESS, CHICAGO, ILLINOIS, U.S.A.

PRINTED BY THE MACK PRINTING GROUP

EASTON, PENNSYLVANIA, U.S.A.

THE ASTROPHYSICAL JOURNAL LETTERS

CONTENTS OF VOLUME 559, PART 2

2001 SEPTEMBER 20, NUMBER 1

	Page
ON THE RELATION BETWEEN HIGH-REDSHIFT STARBURST GALAXIES AND DAMPED Lyα SYSTEMS *Joop Schaye*	L1
REVEALING THE WARM-HOT INTERGALACTIC MEDIUM WITH O VI ABSORPTION *Renyue Cen, Todd M. Tripp, Jeremiah P. Ostriker, and Edward B. Jenkins*	L5
A SHOCK-INDUCED PAIR OF SUPERBUBBLES IN THE HIGH-REDSHIFT POWERFUL RADIO GALAXY MRC 0406−244 *Yoshiaki Taniguchi, Youichi Ohyama, Takashi Murayama, Michitoshi Yoshida, Nobunari Kashikawa, Masanori Iye, Kentaro Aoki, Toshiyuki Sasaki, George Kosugi, Tadafumi Takata, Yoshihiko Saito, Koji S. Kawabata, Kazuhiro Sekiguchi, Kiichi Okita, Yasuhiro Shimizu, Motoko Inata, Noboru Ebizuka, Tomohiko Ozawa, Yasushi Yadomaru, Hiroko Taguchi, Yasuhiro Shioya, Shingo Nishiura, Hiroshi Sudou, Tohru Nagao, Saeko Noda, Yohei Koyama, Yuko Kakazu, Masaru Ajiki, Shinobu S. Fujita, and Rie R. Kobayashi*	L9
CONSTRAINTS ON GALAXY FORMATION FROM STARS IN THE FAR OUTER DISK OF M31 *Annette M. N. Ferguson and Rachel A. Johnson*	L13
THE 2MASS COLOR-MAGNITUDE DIAGRAM OF THE CENTER OF THE SAGITTARIUS DWARF GALAXY: PHOTOMETRIC MEASUREMENTS OF A SURPRISINGLY HIGH MEAN METALLICITY *Andrew A. Cole*	L17
THE DYNAMICS OF THE DWARF ELLIPTICAL GALAXY FS 76: BRIDGING THE KINEMATIC DICHOTOMY BETWEEN ELLIPTICAL AND DWARF ELLIPTICAL GALAXIES *S. De Rijcke, H. Dejonghe, W. W. Zeilinger, and G. K. T. Hau*	L21
"STABLE" QUASI-PERIODIC OSCILLATIONS AND BLACK HOLE PROPERTIES FROM DISKOSEISMOLOGY *Robert V. Wagoner, Alexander S. Silbergleit, and Manuel Ortega-Rodríguez*	L25
DEPENDENCE OF KILOHERTZ QUASI-PERIODIC OSCILLATION PROPERTIES ON THE NORMAL-BRANCH OSCILLATION PHASE IN SCORPIUS X-1 *Wenfei Yu, Michiel van der Klis, and Peter G. Jonker*	L29
SIMULATED X-RAY IMAGES AND SPECTRA OF THE ARCHES CLUSTER *A. C. Raga, P. F. Velázquez, J. Cantó, E. Masciadri, and L. F. Rodríguez*	L33
R AQUARII: EVIDENCE FOR DIFFERENTIAL ROTATION OF THE SiO MASER SHELL *J. M. Hollis, D. A. Boboltz, J. A. Pedelty, S. M. White, and J. R. Forster*	L37
THE THREE-DIMENSIONAL STRUCTURE OF A MASSIVE GAS DISK IN THE GALACTIC CENTRAL REGION *Keiichi Wada*	L41
CHANDRA X-RAY OBSERVATORY STUDY OF VELA SHRAPNEL A *Emi Miyata, Hiroshi Tsunemi, Bernd Aschenbach, and Koji Mori*	L45
REJECTION OF THE C_7^- DIFFUSE INTERSTELLAR BAND HYPOTHESIS *B. J. McCall, J. Thorburn, L. M. Hobbs, T. Oka, and D. G. York*	L49
SIGMOID STRUCTURE OF AN EMERGING FLUX TUBE *T. Magara and D. W. Longcope*	L55
MAGNETOFLUID COUPLING: ERUPTIVE EVENTS IN THE SOLAR CORONA *Shuichi Ohsaki, Nana L. Shatashvili, Zensho Yoshida, and Swadesh M. Mahajan*	L61
TEMPORAL VARIATIONS OF THE SOLAR ROTATION RATE AT HIGH LATITUDES *H. M. Antia and Sarbani Basu*	L67
INSTRUCTIONS TO AUTHORS OF LETTERS, AND ADDITIONAL USEFUL INFORMATION	*Inside Back Cover*
INSTRUCTIONS FOR ELECTRONIC MANUSCRIPT SUBMISSION	*Back Cover*

2001 OCTOBER 1, NUMBER 2

	Page
PREHEATING THE INTRACLUSTER MEDIUM IN HIGH-RESOLUTION SIMULATIONS: THE EFFECT ON THE GAS ENTROPY *S. Borgani, F. Governato, J. Wadsley, N. Menci, P. Tozzi, G. Lake, T. Quinn, and J. Stadel*	L71
RECENT DYNAMICAL RELAXATION OF GALAXY CLUSTERS: EVIDENCE FOR A LOW-Ω_m UNIVERSE *Adrian L. Melott, Scott W. Chambers, and Christopher J. Miller*	L75
LUMINOSITIES AND SPACE DENSITIES OF SHORT GAMMA-RAY BURSTS *Maarten Schmidt*	L79
IRON Kα EMISSION FROM X-RAY REFLECTION: PREDICTIONS FOR GAMMA-RAY BURST MODELS *David R. Ballantyne and Enrico Ramirez-Ruiz*	L83
EVIDENCE FOR JET DOMINATION OF THE NUCLEAR RADIO EMISSION IN LOW-LUMINOSITY ACTIVE GALACTIC NUCLEI *Neil M. Nagar, Andrew S. Wilson, and Heino Falcke*	L87
THE CONSEQUENCES OF THE COSMIC STAR FORMATION RATE: X-RAY NUMBER COUNTS *A. Ptak, R. Griffiths, N. White, and P. Ghosh*	L91
X-RAY PROBES OF COSMIC STAR FORMATION HISTORY *Pranab Ghosh and Nicholas E. White*	L97
DISCOVERY OF AN EXTREMELY RED GALAXY AT $z = 0.65$ WITH DUSTY STAR FORMATION AND NUCLEAR ACTIVITY *J. Afonso, B. Mobasher, B. Chan, and L. Cram*	L101
DUST ABSORPTION AND THE COSMIC ULTRAVIOLET FLUX DENSITY *M. Massarotti, A. Iovino, and A. Buzzoni*	L105
RR LYRAE VARIABLES IN THE GLOBULAR CLUSTERS OF M31: A FIRST DETECTION OF LIKELY CANDIDATES *G. Clementini, L. Federici, C. Corsi, C. Cacciari, M. Bellazzini, and H. A. Smith*	L109
HOW DID GLOBULAR CLUSTERS FORM? *Sidney van den Bergh*	L113
A CONTRIBUTION OF ^{26}Al TO THE O-Al ANTICORRELATION IN GLOBULAR CLUSTER RED GIANTS *P. A. Denissenkov and A. Weiss*	L115
PHASE TRANSITION AND SPIN CLUSTERING OF NEUTRON STARS IN X-RAY BINARIES *Norman K. Glendenning and Fridolin Weber*	L119
KECK MEASUREMENT OF THE XTE J2123−058 RADIAL VELOCITY CURVE *John A. Tomsick, William A. Heindl, Deepto Chakrabarty, Jules P. Halpern, and Philip Kaaret*	L123
CARBON FLASHES IN THE HEAVY-ELEMENT OCEAN ON ACCRETING NEUTRON STARS *Andrew Cumming and Lars Bildsten*	L127
THE COMPACT CENTRAL OBJECT IN THE RX J0852.0−4622 SUPERNOVA REMNANT *George G. Pavlov, Divas Sanwal, Bülent Kızıltan, and Gordon P. Garmire*	L131
THE RESPONSE OF BARE STRANGE STARS TO THE ENERGY INPUT ONTO THEIR SURFACES *Vladimir V. Usov*	L135
THE CONTINUING RADIO EVOLUTION OF SN 1970G *Christopher J. Stockdale, W. M. Goss, John J. Cowan, and R. A. Sramek*	L139
WATER MASER SURVEY TOWARD LOW-MASS YOUNG STELLAR OBJECTS IN THE NORTHERN SKY: OBSERVATIONAL CONSTRAINTS ON MASER EXCITATION CONDITIONS *Ray S. Furuya, Yoshimi Kitamura, H. Alwyn Wootten, Mark J. Claussen, and Ryohei Kawabe*	L143
THE MASS FUNCTION OF MOLECULAR CLOUD CORES *Shu-ichiro Inutsuka*	L149
A PULSAR WIND NEBULA IN THE OXYGEN-RICH SUPERNOVA REMNANT G292.0+1.8 Ⓔ *John P. Hughes, Patrick O. Slane, David N. Burrows, Gordon Garmire, John A. Nousek, C. M. Olbert, and J. W. Keohane*	L153
PROPER MOTIONS OF THE HH 111 JET OBSERVED WITH THE *HUBBLE SPACE TELESCOPE* *Patrick Hartigan, Jon A. Morse, Bo Reipurth, Steve Heathcote, and John Bally*	L157

CONTENTS

THE MILLIMETER-WAVE SPECTRUM OF NiC ($X\,^1\Sigma^+$) AND CoC ($X\,^3\Sigma^+$) L163
M. A. Brewster and L. M. Ziurys

WAVE HEATING AND RANGE OF STELLAR ACTIVITY IN LATE-TYPE DWARFS L167
P. Ulmschneider, D. Fawzy, Z. E. Musielak, and K. Stępień

REVISITING THE DETERMINATION OF THE CORONAL HEATING FUNCTION FROM *YOHKOH* DATA L171
Markus J. Aschwanden

SOLAR CYCLE VARIATIONS OF SUBSURFACE MERIDIONAL FLOWS IN THE SUN L175
Dean-Yi Chou and De-Chang Dai

ABSORPTION CROSS SECTIONS OF HCl AND DCl AT 135–232 NANOMETERS: IMPLICATIONS FOR PHOTODISSOCIATION ON VENUS L179
Mohammed Bahou, Chao-Yu Chung, Yuan-Pern Lee, Bing-Ming Cheng, Yuk L. Yung, and L. C. Lee

ERRATUM

ENRICHMENTS IN VOLATILES IN JUPITER: A NEW INTERPRETATION OF THE *GALILEO* MEASUREMENTS L183
D. Gautier, F. Hersant, O. Mousis, and J. I. Lunine

INSTRUCTIONS TO AUTHORS OF LETTERS, AND ADDITIONAL USEFUL INFORMATION *Inside Back Cover*

INSTRUCTIONS FOR ELECTRONIC MANUSCRIPT SUBMISSION *Back Cover*